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DATE OF MAILING 1/9/62

Our Case No. 9281-4260
Client Reference No. S US00198

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
Masaki Yamamoto et al.)
Serial No. To be Assigned)
Filing Date: Herewith)
For Combination Tuner Capable of Receiving)
Television Signal and FM Signal)

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Prior to examination of the above-identified application, please amend the application as follows:

In the Specification

Please rewrite the paragraph beginning on page 1, line 20 and ending on page 2, line 12 as follows:

(Amended) As shown in Fig. 3, the combination tuner includes an external antenna 31, an internal antenna 32, a low-pass filter (LPF) 33, a band-pass filter (BPF) 34, a television signal selection stage 35, an FM signal selection stage 36, an FM trap (FM TR) 37, a radio-frequency amplifier stage (RF AMP) 38, a radio-frequency tuner stage 39, a frequency mixer stage (MIX) 40, a local oscillator (L OSC) 41, an intermediate-frequency bandwidth switching stage (IF SW) 42, an intermediate-frequency amplifier stage (IF AMP) 43, a gain setting stage 44, a switching circuit 45, an intermediate-frequency signal output terminal 46, an automatic gain control (AGC) voltage supply terminal 47, a band data supply terminal 48, and a power supply terminal 49. The external antenna 31 is a high

sensitivity antenna, and is connected to the combination tuner through a connector (not shown). The internal antenna 32 is a low sensitivity antenna, and is connected to the combination tuner through a pin diode (not shown). Other circuit components are connected in such a way as shown in Fig. 3.

Please rewrite the paragraph on page 7, lines 4-12 as follows:

(Amended) Upon receipt of the power supply voltage at the control input, the FM trap 37 deactivates an FM trap for trapping an FM frequency band signal. Upon receipt of the power supply voltage at the control input, the intermediate frequency bandwidth switching stage 42 switches the intermediate frequency band to 1.2 MHz which is the intermediate frequency band of the FM signal. Upon receipt of the power supply voltage at the control input, the gain setting stage 44 sets a small signal gain for the gain setting stage 44.

Please rewrite the paragraph on page 7, lines 13-17 as follows:

(Amended) For selection and output of the FM signal, the maximum gain set voltage is further applied to the automatic gain control voltage supply terminal 47 so that the gain of the radio-frequency amplifier stage 38 is controlled so as to be maximized.

Please rewrite the paragraph beginning on page 14, line 21 and ending on page 15, line 8 as follows:

(Amended) The band data which is used to set operation mode of the combination tuner at any one of the following three modes: a television mode using the external antenna 1 (first mode); an FM mode using the internal antenna 2 (second mode); and an FM mode using the external antenna 1 (third mode) is supplied to the pair of band data supply terminals 18_1 and 18_2 from an external controller (not shown). In the first mode, code 0 equivalent to a ground voltage is applied to the terminal 18_1 , and code 0 indicating the ground voltage is applied to the terminal 18_2 . In the second mode, code 0 indicating the ground voltage is applied to the terminal 18_1 , and code 1 equivalent to a power supply voltage is applied to the terminal 18_2 . In the third mode, code 1 indicating the power supply voltage is applied to the terminal 18_1 , and code 1 indicating the power supply voltage is applied to the terminal 18_2 .

Please rewrite the paragraph beginning on page 15, line 9 and ending on page 16, line 17 as follows:

(Amended) The external antenna 1 is a high sensitivity antenna, and is connected to the combination tuner through a connector (not shown). The internal antenna 2 is a low sensitivity antenna, and is connected to the combination tuner through a pin diode (not shown). The low-pass filter 3 has the input connected to the external antenna 1, and the output connected to the input of the first signal selection stage 5. The band-pass filter 4 has the input connected to the internal antenna 2, and the output connected to the input of the second signal selection stage 6. The FM trap 7 has the input connected to the outputs of the first and second signal selection stages 5 and 6, and the output connected to the input of the radio-frequency amplifier stage 8. The output of the radio-frequency amplifier stage 8 is connected to the input of the radio-frequency tuner stage 9. The frequency mixer stage 10 has a first input connected to the output of the radio-frequency tuner stage 9, a second input connected to the output of the local oscillator 11, and the output connected to the input of the intermediate frequency bandwidth switching stage 12. The intermediate frequency amplifier stage 13 has the input connected to the output of the intermediate frequency bandwidth switching stage 12, and the output connected to the input of the gain setting stage 14. The output of the gain setting stage 14 is connected to the intermediate frequency signal output terminal 16. The input of the switching circuit 15 is connected to the band data supply terminals 18₁ and 18₂, and the output of the switching circuit 15 is connected to the control input of the second signal selection stage 6, the control input of the FM trap 7, the control input of the intermediate frequency bandwidth switching stage 12, and the control input of the gain setting stage 14. The automatic gain control voltage supply terminal 17 is connected to the control input of the radio-frequency amplifier stage 8 via a buffer resistor (not numbered).

Please rewrite the paragraph on page 21, lines 15-23 as follows:

(Amended) Upon receipt of the power supply voltage at the control input, the FM trap 7 deactivates an FM trap for trapping an FM frequency band signal. Upon receipt of the power supply voltage at the control input, the intermediate frequency band switching stage 12 switches the intermediate frequency band to 1.2 MHz which is the intermediate frequency band of the FM signal. Upon receipt of the power

supply voltage at the control input, the gain setting stage 14 sets a small signal gain for the gain setting stage 14.

Please rewrite the paragraph beginning on page 23, line 22 and ending on page 24, line 3 as follows:

(Amended) Upon receipt of the power supply voltage at the control input, the FM trap 7 deactivates an FM trap for trapping an FM frequency band signal. Upon receipt of the power supply voltage at the control input, the intermediate frequency band switching stage 12 switches the intermediate frequency band to 1.2 MHz which is the intermediate frequency band of the FM signal. Upon receipt of the power supply voltage at the control input, the gain setting stage 14 sets a small signal gain for the gain setting stage 14.

Please rewrite the paragraph beginning on page 26, line 16 and ending on page 27, line 9 as follows:

(Amended) In the second mode where the reception field intensity of the FM signal exceeds 90 dB μ , the codes in the second mode are applied to the pair of band data supply terminals 18₁ and 18₂, namely, code 1 and code 1 are applied to the terminals 18₁ and 18₂, respectively. The two codes 1 and 1 are then forwarded to the switching circuit 20. When the switching circuit 20 receives the two codes 1 and 1, the transistor 20₁ of emitter-follower connected type and the common-emitter transistor 20₂ are simultaneously turned on. The transistor 20₁ which is turned on allows a power supply voltage to be applied to the emitter of the transistor 20₃, and the transistor 20₂ which is turned on allows a gain control voltage which is divided by the resistors 20₅ and 20₆ to be applied to the base of the transistor 20₃. Then, the transistor 20₃ is turned on. One of the two outputs of the switching circuit 20 which is supplied to the second signal selection stage 6 becomes a power supply voltage, and the other output which is supplied to the control inputs of the FM trap 7, the intermediate frequency bandwidth switching stage 12, and the gain setting stage 14 becomes a power supply voltage.

Please rewrite the paragraph beginning on page 27, line 23 and ending on page 28, line 4 as follows:

(Amended) Upon receipt of the power supply voltage at the control input, the FM trap 7 deactivates an FM trap for trapping an FM frequency band signal. Upon receipt of the power supply voltage at the control input, the intermediate frequency band switching stage 12 switches the intermediate frequency band to 1.2 MHz which is the intermediate frequency band of the FM signal. Upon receipt of the power supply voltage at the control input, the gain setting stage 14 sets a small signal gain for the gain setting stage 14.

Please rewrite the paragraph on page 30, lines 9-17 as follows:

(Amended) Upon receipt of the power supply voltage at the control input, the FM trap 7 deactivates an FM trap for trapping an FM frequency band signal. Upon receipt of the power supply voltage at the control input, the intermediate frequency band switching stage 12 switches the intermediate frequency band to 1.2 MHz which is the intermediate frequency band of the FM signal. Upon receipt of the power supply voltage at the control input, the gain setting stage 14 sets a small signal gain for the gain setting stage 14.

In the Claims

Please rewrite Claim 1 as follows:

1. (Amended) A combination tuner comprising:
 - a first signal receiving unit to receive a television signal and an FM signal using an externally connected antenna;
 - a second signal receiving unit to receive an FM signal using an internal antenna;
 - a signal selecting unit to select reception signals of said first signal receiving unit and a reception signal of said second signal receiving unit;
 - a radio-frequency selecting and amplifying unit to select and amplify the resulting reception signal;
 - a frequency converting unit to convert the amplified radio-frequency signal into an intermediate frequency signal;
 - an intermediate frequency selecting and amplifying unit to select and amplify the intermediate frequency signal; and

a switching circuit to switch selection of the television signal or the FM signal according to three-mode band data,

wherein said switching circuit includes three transistors which are selectively turned on and off so that one of the television signal from said first signal receiving unit, the FM signal from said second signal receiving unit, and the FM signal from said first signal receiving unit is selected according to the mode of the band data.

Please rewrite Claim 2 as follows:

2. (Amended) A combination tuner according to Claim 1, wherein said switching circuit includes a first transistor whose base is supplied with the band data, the first transistor being an emitter-follower, a second transistor whose base is supplied with the band data, the second transistor being an emitter-follower, and a third transistor whose base and emitter are supplied with an output of the first transistor and an output of the second transistor, respectively.

Please rewrite Claim 3 as follows:

3. (Amended) A combination tuner comprising:
a first signal receiving unit to receive a television signal and an FM signal using an externally connected antenna;
a second signal receiving unit to receive an FM signal using an internal antenna;
a signal selecting unit to select reception signals of said first signal receiving unit and a reception signal of said second signal receiving unit;
a radio-frequency selecting and amplifying unit to select and amplify the resulting reception signal;
a frequency converting unit to convert the amplified radio-frequency signal into an intermediate frequency signal;
an intermediate frequency selecting and amplifying unit to select and amplify the intermediate frequency signal; and
a switching circuit to switch selection of the television signal or the FM signal according to three-mode band data,
wherein said switching circuit includes three transistors which are selectively turned on and off such that one of the television signal from said first

signal receiving unit, the FM signal from said second signal receiving unit, and the FM signal from said first signal receiving unit is selected according to the mode of the band data, and such that an automatic gain control voltage which is supplied to said radio-frequency selecting and amplifying unit is attenuated when the FM signal from said second signal receiving unit is selected.

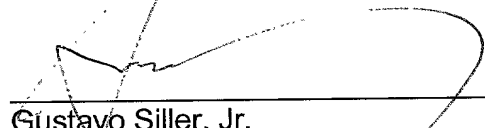
Please rewrite Claim 4 as follows:

4. (Amended) A combination tuner according to Claim 3, wherein said switching circuit includes a first transistor whose base is supplied with the band data, the first transistor being an emitter-follower, a second common-emitter transistor whose base is supplied with the band data and whose collector is supplied with the automatic gain control voltage via a resistor divider, and a third transistor whose base is supplied with a divided voltage of the automatic gain control voltage and whose emitter is supplied with an output of the first transistor.

REMARKS

Applicants have rewritten portions of the specification and Claims 1-4. The changes from the previous version to the rewritten version are shown in attached Appendix A, with strikethrough for deleted matter and underlines for added matter.

Respectfully submitted,



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APPENDIX A
Combination Tuner Capable of Receiving Television Signal
and FM Signal
Attorney Docket No. 9281-4260
Inventor Masaki Yamamoto et al.

In the Specification

Please amend the paragraph beginning on page 1, line 20 and ending on page 2, line 12 as follows:

(Amended) As shown in Fig. 3, the combination tuner includes an external antenna 31, an internal antenna 32, a low-pass filter (LPF) 33, a band-pass filter (BPF) 34, a television signal selection stage 35, an FM signal selection stage 36, an FM trap (FM TR) 37, a radio-frequency amplifier stage (RF AMP) 38, a radio-frequency tuner stage 39, a frequency mixer stage (MIX) 40, a local oscillator (L OSC) 41, an intermediate-frequency bandwidth switching stage (IF SW) 42, an intermediate-frequency amplifier stage (IF AMP) 43, a gain setting stage 44, a switching circuit 45, an intermediate-frequency signal output terminal 46, an automatic gain control (AGC) voltage supply terminal 47, a band data supply terminal 48, and a power supply terminal 49. The external antenna 31 is a high sensitivity antenna, and is connected to the combination tuner through a connector (not shown). The internal antenna 32 is a low sensitivity antenna, and is connected to the combination tuner through a pin diode (not shown). Other circuit components are connected in such a way as shown in Fig. 3.

Please amend the paragraph on page 7, lines 4-12 as follows:

(Amended) Upon receipt of the power supply voltage at the control input, the FM trap 37 ~~inactivates~~deactivates an FM trap for trapping an FM frequency band signal. Upon receipt of the power supply voltage at the control input, the intermediate frequency bandwidth switching stage 42 switches the intermediate frequency band to 1.2 MHz which is the intermediate frequency band of the FM signal. Upon receipt of the power supply voltage at the control input, the gain setting stage 44 sets a small signal gain for the gain setting stage 44.

Please amend the paragraph on page 7, lines 13-17 as follows:

(Amended) For selection and output of the FM signal, the maximum gain set voltage is further applied to the automatic gain control voltage supply terminal 4947 so that the gain of the radio-frequency amplifier stage 38 is controlled so as to be maximized.

Please amend the paragraph beginning on page 14, line 21 and ending on page 15, line 8 as follows:

(Amended) The band data which is used to set operation mode of the combination tuner at any one of the following three modes: a television mode using the external antenna 1 (first mode); an FM mode using the internal antenna 2 (second mode); and an FM mode using the external antenna 1 (third mode) is supplied to the pair of band data supply terminals 18₁ and 18₂ from an external controller (not shown). In the first mode, code 0 equivalent to a ground voltage is applied to the terminal 18₁, and code 0 indicating the sameground voltage is applied to the terminal 18₂. In the second mode, code 0 indicating the sameground voltage is applied to the terminal 18₁, and code 1 equivalent to a power supply voltage is applied to the terminal 18₂. In the third mode, code 1 indicating the samepower supply voltage is applied to the terminal 18₁, and code 1 indicating the samepower supply voltage is applied to the terminal 18₂.

Please amend the paragraph beginning on page 15, line 9 and ending on page 16, line 17 as follows:

(Amended) The external antenna 1 is a high sensitivity antenna, and is connected to the combination tuner through a connector (not shown). The internal antenna 2 is a low sensitivity antenna, and is connected to the combination tuner through a pin diode (not shown). The low-pass filter 3 has the input connected to the external antenna 1, and the output connected to the input of the first signal selection stage 5. The band-pass filter 4 has the input connected to the internal antenna 2, and the output connected to the input of the second signal selection stage 6. The FM trap 7 has the input connected to the outputs of the first and second signal selection stages 5 and 6, and the output connected to the input of the radio-frequency amplifier stage 8. The output of the radio-frequency amplifier stage 8 is connected to the input of the radio-frequency tuner stage 9. The frequency mixer

stage 10 has a first input connected to the output of the radio-frequency tuner stage 9, a second input connected to the output of the local oscillator 11, and the output connected to the input of the intermediate frequency bandwidth switching stage 12. The intermediate frequency amplifier stage 13 has the input connected to the output of the intermediate frequency bandwidth switching stage 12, and the output connected to the input of the gain setting stage 14. The output of the gain setting stage 14 is connected to the intermediate frequency signal output terminal 16. The input of the switching circuit 15 is connected to the band data supply terminal 18 and terminals 18₁ and 18₂, and the output of the switching circuit 15 is connected to the control input of the second signal selection stage 6, the control input of the FM trap 7, the control input of the intermediate frequency bandwidth switching stage 12, and the control input of the gain setting stage 14. The automatic gain control voltage supply terminal 17 is connected to the control input of the radio-frequency amplifier stage 8 via a buffer resistor (not numbered).

Please amend the paragraph on page 21, lines 15-23 as follows:

(Amended) Upon receipt of the power supply voltage at the control input, the FM trap 7 ~~inactivates~~deactivates an FM trap for trapping an FM frequency band signal. Upon receipt of the power supply voltage at the control input, the intermediate frequency band switching stage 12 switches the intermediate frequency band to 1.2 MHz which is the intermediate frequency band of the FM signal. Upon receipt of the power supply voltage at the control input, the gain setting stage 14 sets a small signal gain for the gain setting stage 14.

Please amend the paragraph beginning on page 23, line 22 and ending on page 24, line 3 as follows:

(Amended) Upon receipt of the power supply voltage at the control input, the FM trap 7 ~~inactivates~~deactivates an FM trap for trapping an FM frequency band signal. Upon receipt of the power supply voltage at the control input, the intermediate frequency band switching stage 12 switches the intermediate frequency band to 1.2 MHz which is the intermediate frequency band of the FM signal. Upon receipt of the power supply voltage at the control input, the gain setting stage 14 sets a small signal gain for the gain setting stage 14.

Please amend the paragraph beginning on page 26, line 16 and ending on page 27, line 9 as follows:

(Amended) In the second mode where the reception field intensity of the FM signal exceeds 90 dB μ , the codes in the second mode are applied to the pair of band data supply terminals 18₁ and 18₂, namely, code 1 and code 1 are applied to the terminals 18₁ and 18₂, respectively. The two codes 1 and 1 are then forwarded to the switching circuit 20. When the switching circuit 20 receives the two codes 1 and 1, the transistor 20₁ of emitter-follower connected type and the common-emitter transistor 20₂ are simultaneously turned on. The transistor 20₁ which is turned on allows a power supply voltage to be applied to the emitter of the transistor 20₃, and the transistor 20₂ which is turned on allows a gain control voltage which is divided by the resistors 20₅ and 20₆ to be applied to the base of the transistor 20₃. Then, the transistor 20₃ is turned on. One of the two outputs of the switching circuit 20 which is supplied to the second signal selection stage 6 becomes a power supply voltage, and the other output which is supplied to the control inputs of the FM trap 7, the intermediate frequency bandwidth switching stage 12, and the gain setting stage 14 becomes a power supply voltage.

Please amend the paragraph beginning on page 27, line 23 and ending on page 28, line 4 as follows:

(Amended) Upon receipt of the power supply voltage at the control input, the FM trap 7 ~~inactivates~~deactivates an FM trap for trapping an FM frequency band signal. Upon receipt of the power supply voltage at the control input, the intermediate frequency band switching stage 12 switches the intermediate frequency band to 1.2 MHz which is the intermediate frequency band of the FM signal. Upon receipt of the power supply voltage at the control input, the gain setting stage 14 sets a small signal gain for the gain setting stage 14.

Please amend the paragraph on page 30, lines 9-17 as follows:

(Amended) Upon receipt of the power supply voltage at the control input, the FM trap 7 ~~inactivates~~deactivates an FM trap for trapping an FM frequency band signal. Upon receipt of the power supply voltage at the control input, the intermediate frequency band switching stage 12 switches the intermediate frequency

band to 1.2 MHz which is the intermediate frequency band of the FM signal. Upon receipt of the power supply voltage at the control input, the gain setting stage 14 sets a small signal gain for the gain setting stage 14.

In the Claims

Please amend Claim 1 as follows:

1. (Amended) A combination tuner comprising:
 - a first signal receiving unit ~~for receiving~~to receive a television signal and an FM signal using an externally connected antenna;
 - a second signal receiving unit ~~for receiving~~to receive an FM signal using an internal antenna;
 - a signal selecting unit ~~for selecting~~to select reception signals of said first signal receiving unit and a reception signal of said second signal receiving unit;
 - a radio-frequency selecting and amplifying unit ~~for selecting~~to select and amplifying the resulting reception signal;
 - a frequency converting unit ~~for converting~~to convert the amplified radio-frequency signal into an intermediate frequency signal;
 - an intermediate frequency selecting and amplifying unit ~~for selecting~~to select and amplifying the intermediate frequency signal; and
 - a switching circuit ~~for switching~~to switch selection of the television signal or the FM signal according to three-mode band data,wherein said switching circuit includes three transistors which are selectively turned on and off so that one of the television signal from said first signal receiving unit, the FM signal from said second signal receiving unit, and the FM signal from said first signal receiving unit is selected according to the mode of the band data.

Please amend Claim 2 as follows:

2. (Amended) A combination tuner according to Claim 1, wherein said switching circuit includes a first transistor whose base is supplied with the band data, the first transistor being an emitter-follower-connected type one, a second transistor whose base is supplied with the band data, the second transistor being an emitter-follower-connected type one, and a third transistor whose base and emitter are

supplied with the an output of the first transistor and the an output of the second transistor, respectively.

Please amend Claim 3 as follows:

3. (Amended) A combination tuner comprising:

a first signal receiving unit ~~for receiving~~to receive a television signal and an FM signal using an externally connected antenna;

a second signal receiving unit ~~for receiving~~to receive an FM signal using an internal antenna;

a signal selecting unit ~~for selecting~~to select reception signals of said first signal receiving unit and a reception signal of said second signal receiving unit;

a radio-frequency selecting and amplifying unit ~~for selecting~~to select and amplifying the resulting reception signal;

a frequency converting unit ~~for converting~~to convert the amplified radio-frequency signal into an intermediate frequency signal;

an intermediate frequency selecting and amplifying unit ~~for selecting~~to select and amplifying the intermediate frequency signal; and

a switching circuit ~~for switching~~to switch selection of the television signal or the FM signal according to three-mode band data,

wherein said switching circuit includes three transistors which are selectively turned on and off ~~so~~such that one of the television signal from said first signal receiving unit, the FM signal from said second signal receiving unit, and the FM signal from said first signal receiving unit is selected according to the mode of the band data, and ~~so~~such that an automatic gain control voltage which is supplied to said radio-frequency selecting and amplifying unit is attenuated when the FM signal from said second signal receiving unit is selected.

Please amend Claim 4 as follows:

4. (Amended) A combination tuner according to Claim 3, wherein said switching circuit includes a first transistor whose base is supplied with the band data, the first transistor being an emitter-follower ~~connected type one~~, a second common-emitter transistor whose base is supplied with the band data and whose collector is supplied with the automatic gain control voltage via a resistor divider, and a third

transistor whose base is supplied with a divided voltage of the automatic gain control voltage and whose emitter is supplied with the an output of the first transistor.